



## Mounting and Operating Instructions

**EB 3701 EN**

Edition January 2015



**Ex**  
certified

### Note on these mounting and operating instructions

These mounting and operating instructions (EB) assist you in mounting and operating the device safely. The instructions are binding for handling SAMSON/SAMSOMATIC devices.

- ➔ For the safe and proper use of these instructions, read them carefully and keep them for later reference.
- ➔ If you have any questions about these instructions, contact SAMSON's After-sales Service department ([aftersaleservice@samson.de](mailto:aftersaleservice@samson.de)).

### Referenced documentation

The documents for the devices used in combination with the solenoid valve apply in addition to these mounting and operating instructions.

The mounting and operating instructions for all supplied devices are included in the delivery. The latest versions of the documents are available on our website at [www.samson.de](http://www.samson.de) > Product documentation.

#### Definition of signal words



##### **DANGER!**

*Hazardous situations which, if not avoided, will result in death or serious injury*



##### **NOTICE**

*Property damage message or malfunction*



##### **WARNING!**

*Hazardous situations which, if not avoided, could result in death or serious injury*



##### **Note:**

*Additional information*



##### **Tip:**

*Recommended action*

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# 1 General safety instructions

- The device is to be mounted, started up or operated only by trained and experienced personnel familiar with the product.  
According to these mounting and operating instructions, trained personnel refers to individuals who are able to judge the work they are assigned to and recognize possible dangers due to their specialized training, their knowledge and experience as well as their knowledge of the applicable standards.
- Explosion-protected versions of this device are to be operated only by personnel who has undergone special training or instructions or who is authorized to work on explosion-protected devices in hazardous areas.
- Any hazards that could be caused in the control valve by the process medium, the signal pressure or by moving parts are to be prevented by taking appropriate precautions.
- The supply air must not exceed the maximum permissible supply pressure and must be limited by supply pressure regulator, if necessary.
- If inadmissible motions or forces are produced in the pneumatic actuator as a result of the supply pressure level, it must be restricted using a suitable supply pressure reducing station.
- Proper shipping and storage are assumed.


## 1.1 Legal information

The Type 3701 Solenoid Valve bears a CE marking. The declaration of conformity includes information about the applied conformity assessment procedure. The declarations of conformity are included in the Appendix of these instructions.





## 2 Markings on the control valve

### 2.1 Nameplate

#### Version without explosion protection

<b>SAMSOMATIC 3701</b>					
Magnetventil		Solenoid valve			
Electrovanne					
3701 -		1		GI 14/TÜV	
Serial no.		2		Var.ID: 3	
U	4	V	U <sub>max.</sub>	8	V
I	5	mA	I <sub>max.</sub>	9	mA
DC	6	AC	7	Made in France	

#### Version with explosion protection

<b>SAMSON 3701-1</b>					
Solenoid valve		U <sub>N</sub> 4 V DC			
		10		PTB 01 ATEX 2178	
*U <sub>i</sub> ≤ 11 V; *I <sub>i</sub> ≤ 12 mA; *P <sub>i</sub> ≤ 13 mW					
C <sub>1</sub> ≈ 0 nF; L <sub>1</sub> ≈ 0 μH					
* See technical data and explosion-protection certificate					
 for permissible ambient temperature and maximum values for connection to certified intrinsically safe circuits.					
Model 3701 -		1		GI 14/SIL	
Var.ID:		3		Serial no. 2	
SAMSON AG D-60314 Frankfurt				Made in Germany	

- |   |                            |    |                    |
|---|----------------------------|----|--------------------|
| 1 | Article code               | 8  | Maximum voltage    |
| 2 | Serial no.                 | 9  | Maximum current    |
| 3 | Configuration ID (Var.-ID) | 10 | Type of protection |
| 4 | Nominal voltage            | 11 | Output voltage     |
| 5 | Nominal current            | 12 | Output current     |
| 6 | DC marking                 | 13 | Power dissipation  |
| 7 | AC marking                 |    |                    |

## 2.2 Article code

Solenoid valve	Type 3701-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<b>Explosion protection</b>																
Without	0															
II 2G Ex ia II C T6/II 2D Ex tb IIIC T 80 °C IP65 ATEX	1															
Ex ia CSA/FM	3															
II 3G Ex nA/ic II T6 / II 3D Ex tc IIIC T 80 °C IP65 ATEX	8															
<b>Nominal signal</b>																
6 V DC	1															
12 V DC	2															
24 V DC	3															
230 V AC (without explosion protection)	5															
115 V AC (without explosion protection)	6															
48 V AC (without explosion protection)	7															
24 V AC (without explosion protection)	8															
<b>Switching function</b>																
3/2-way, NC, $K_{VS} = 0.25$ , circuit 1	0															
3/2-way, NC, $K_{VS} = 0.25$ , circuit 2	1															
5/2-way, $K_{VS} = 0.25$	2															
<b>Attachment</b>																
NAMUR interface for rotary actuators including adapter plate (1400-5235)	0															
NAMUR rib for linear actuators	1															
NAMUR adapter plate (1400-5235) additionally required for rotary actuators	2															
<b>Threaded connection</b>																
G ¼	0															
¼ NPT	1															
<b>Electrical connection</b>																
Without cable gland, fitted with blanking plug	0	0														
Black cable gland M20 x 1.5	0	1														
Blue cable gland M20 x 1.5	1	1														
Adapter M20 x 1.5 to ½ NPT	1	2														
Black CEAG cable gland M20 x 1.5	1	3														
Cable gland M20 x 1.5, brass	1	4														
Harting connector, without cable socket	2	1														
Connector M12 x 1, nickel-plated brass, without cable socket	2	2														
Connector type A according to DIN EN 175301-803, without cable socket	2	3														
Binder connector, without cable socket	2	4														

Solenoid valve	Type 3701-	x	x	x	x	x	x	x	x	x	x	x	x	x	x
<b>Degree of protection</b>															
IP 54	0														
IP 65, with filter check valve made of polyamide	1														
IP 65, with filter check valve made of stainless steel	2														
IP 20	3														
<b>Ambient temperature</b>															
-20 to +80 °C	0														
-45 to +80 °C	2														
<b>Safety approval</b>															
Without	0														
SIL (only with 3/2-way function)	1														
TÜV (only with 3/2-way function)	2														
<b>Special version</b>															
On request													x	x	x

### 3 Design and principle of operation

The Type 3701 Solenoid Valve is suitable for controlling pneumatic linear actuators with NAMUR rib according to IEC 60534 or pneumatic rotary actuators with NAMUR interface according to VDI/VDE 3845.

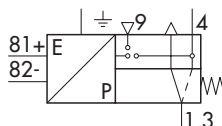
Its operating principle is based on a flap-per/nozzle assembly and a booster valve with diaphragm actuator.

Intrinsically safe, low-power binary signals issued by automation equipment or fieldbus systems can be used for controlling purposes.

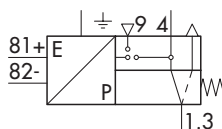
The Type 3701 Solenoid Valve implements 3/2-way or 5/2-way functions with  $K_{VS}$  0.25 (see Fig. 1) depending on the version.

→ Fig. 2 shows the solenoid valve with the enclosure cover removed.

#### 3/2-way function

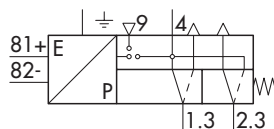


Type 3701-xx0,  
neutral position "actuator vented"



Type 3701-xx1,  
neutral position "actuator filled with air"

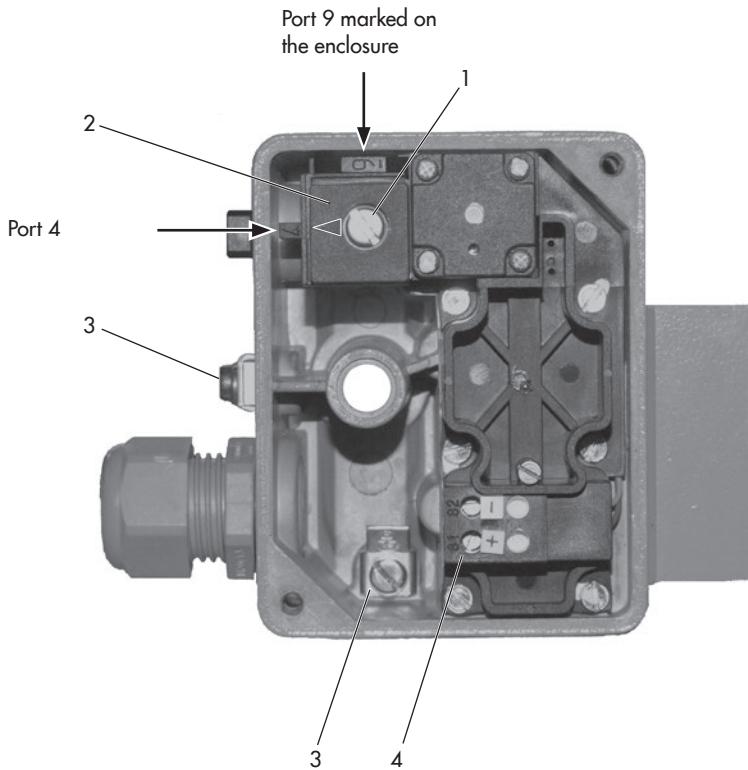
#### 5/2-way function



Type 3701-xx2,  
neutral position "actuator vented"

Fig. 1: Switching functions





- 1 Fastening screw
- 2 Turnboard with marking
- 2 PE terminal
- 4 Terminal connection

**Fig. 2:** Solenoid valve with the enclosure cover removed

## 3.1 Technical data

General data	
Version	Solenoid with flapper/nozzle assembly and diaphragm switching elements
Degree of protection	IP 54 with filter, IP 65 with filter check valve
Ambient temperature	See Electric data
Mounting position	Any desired position
Compliance	<div>CE · EAC</div>
Material	
Enclosure	AlMg, powder coated, gray beige RAL 1019
NAMUR adapter plate	AlMg, powder coated, gray beige RAL 1019
Screws	1.4571
Springs	1.4310
Seals	Silicone rubber, Perbunan®
Diaphragms	Chloroprene rubber 57 Cr 868 (–20 to +80 °C) · Silicone rubber (–45 to +80 °C)
Weight	
Approx.	450 g

Electric data					
Nominal signal	$U_N$	6 V DC	12 V DC	24 V DC	
	$U_{max}$	27 V	25 V	32 V	
Switching point	$U_{80\text{ °C}}$	≥ 4.8 V	≥ 9.6 V	≥ 18 V	
	On	$I_{20\text{ °C}}$	≥ 1.41 mA	≥ 1.52 mA	≥ 1.57 mA
		$P_{20\text{ °C}}$	≥ 5.47 mW	≥ 13.05 mW	≥ 26.71 mW
		Off <sub>–25 °C</sub>	$U$	≤ 1.0 V	≤ 2.4 V
	Input impedance	R	2.6 kΩ	5.5 kΩ	10.7 kΩ
Temperature influence		0.4 %/K	0.2 %/K	0.1 %/K	
Type of protection <sup>1)</sup>	Intrinsic safety: II 2G Ex ia IIC T6, non-sparking: II 3G Ex nA II T6				
Output voltage <sup>2)</sup>	$U_i$ (V)	25/27/28/30/32			
Output current <sup>2)</sup>	$I_i$ (mA)	150/125/115/100/85			
Power dissipation	$P_i$ (mW)	250	No restrictions		
Outer inductivity <sup>2)</sup>	$L_i$	Negligibly small			
Outer capacitance <sup>2)</sup>	$C_i$	Negligibly small			
Ambient temperature <sup>7)</sup>	–45 to +60 °C (temperature class T6) –45 to +70 °C (temperature class T5) –45 to +80 °C (temperature class T4)				
Connection	See article code on page 6				

Electric data					
Nominal signal	$U_N$	24 V AC	48 V AC	115 V AC	230 V AC
	$U_{max}$	36 V	80 V	130 V	255 V
	f	48 to 62 Hz			
Switching point	$U_{+80\text{ °C}}$	≥ 19 to 36 V	≥ 42 to 80 V	≥ 82 to 130 V	≥ 183 to 255 V
	On $I_{+20\text{ °C}}$	≥ 1.9 mA	≥ 1.9 mA	≥ 2.2 mA	≥ 2.6 mA
	$P_{+20\text{ °C}}$	≥ 0.04 VA	≥ 0.07 VA	≥ 0.17 VA	≥ 0.46 VA
	Off $U_{-25\text{ °C}}$	≤ 4.5 V	≤ 9 V	≤ 18 V	≤ 36 V
	R	Approx. 10 kΩ	Approx. 24 kΩ	Approx. 40 kΩ	Approx. 80 kΩ
Input impedance		Approx. 10 kΩ	Approx. 24 kΩ	Approx. 40 kΩ	Approx. 80 kΩ
Temperature influence		0.1 %/K	0.1 %/K	0.05 %/K	0.03 %/K
Type of protection <sup>1)</sup>		No explosion protection			

<sup>1)</sup> EC type examination certificate PTB 01 ATEX 2178 and statement of conformity PTB 02 ATEX 2014 X

<sup>2)</sup> Permissible maximum values when connected to a certified intrinsically safe circuit.

Pneumatic data		
Type 3701	-xx0 / -xx1	-xx2
Safety function	TÜV <sup>1)</sup> /SIL <sup>1)</sup>	–
Version	3/2-way function	5/2-way function
$K_{VS}$ <sup>2)</sup>	0.25	0.25
Supply air	Medium	Instrument air (free from corrosive substances) or nitrogen
	Pressure	1.4 to 6 bar
Operating medium	Instrument air (free from corrosive substances) <sup>3)</sup> Air containing oil or nitrogen or non-corrosive gases <sup>4)</sup>	
Operating pressure	Max. 6 bar	
Output signal	Operating pressure	
Air consumption	≤ 80 l <sub>n</sub> /h at 1.4 bar supply air in neutral position ≤ 10 l <sub>n</sub> /h at 1.4 bar supply air in operating position	
Switching time <sup>5)</sup>	≤ 65 ms	
Service life	≥ 2 × 10 <sup>7</sup> switching cycles (at –20 to +80 °C) ≥ 2 × 10 <sup>6</sup> switching cycles (at –45 to +80 °C)	
Connection	G ¼ (¼ NPT)	

<sup>1)</sup> Report no. S 384 2013 E2 (used on control valves according to DIN 3394 Part 1, DIN EN 161, DIN 32725, DIN EN 264 and DIN 32730); Report no. V 60.09/14 rev. 02 (certification for safety-instrumented systems according to IEC 61508/SIL).







<sup>2)</sup> The air flow rate when  $p_1 = 2.4$  bar and  $p_2 = 1.0$  bar can be calculated using the following formula:  
 $Q = K_{VS} \times 36.22$  in m<sup>3</sup>/h.

<sup>3)</sup> With internal air supply (delivered status)

<sup>4)</sup> With external air supply

<sup>5)</sup> Permissible ambient temperature –45 °C only applicable with diaphragm and seals made of silicone rubber and metal cable gland

## 3.2 Summary of explosion protection approvals

Type	Certification			Type of protection/comments
3701	<b>SIL</b>	No. V 60.09/14 rev. 01 Date 2006-02-22		Certification for safety-instrumented systems according to IEC 61508
	<b>TÜV</b>	No. S 284 2013 E2 Date 2014-01-16		Mounted on control valves according to DIN 3394-1, DIN EN 161, DIN 32725, DIN EN 264 and DIN 32730
3701-1	 EC type examination certificate	No. PTB 01 ATEX 2178 Date 2006-02-22		II 2G Ex ia IIC T6 II 2D Ex tb IIIC T80°C IP65
		No. RU C DE 08.B.00764 Date 2015-02-10 Valid until 2020-02-09		1Ex ia IIC T6/T5/T4/ Gb X
3701-3		No. 1607252 Date 2005-09-16		Ex ia IIC T6: Class I, Zone 0 Class I, Div.1, Groups A, B, C, D Class II, Div. 1, Groups E, F, G Class I, Div. 2, Groups A, B, C, D Class II, Div. 2, Groups E, F, G
		No. 3020228 Date 2011-06-06		Class I, Zone 0 AEx ia IIC Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G Class I, Div. 2, Groups A, B, C, D Class II, Div. 2 Groups F, G; Class III Type 3R
3701-8	 EC type examination certificate	No. PTB 02 ATEX 2014 X Date 2006-02-22		II 3G Ex nA II T6 II 3G Ex ic IIC T6 II 3D Ex tc IIIC T80°C IP65
		No. RU C DE 08.B.00764 Date 2015-02-10 Valid until 2020-02-09		2Ex nA IIC T6/T5/T4 Gc X 2Ex ic IIC T6/T5/T4 Gc X

## 4 Accessories

Designation	Order no.
Adapter plate for rotary actuators with NAMUR interface according to VDI/VDE 3845	1400-5235
Mounting parts for valves with rod-type yokes according to NAMUR	1400-5342
Mounting parts for Series 240 in DN 15 to 80, in case positioner and/or limit switch is to be mounted as well	1400-5905
Cable socket according to EN 175301-803, Form A, made of polyamide, black, degree of protection IP 65	0790-6658
Cable socket (Harting), 7-pole, made of aluminum, silver, degree of protection IP 65	1400-8298
Cable socket (Binder), 7-pole, made of PBT GV, black, degree of protection IP 67	8831-0716
Cable socket M12 x 1, 4-pole, angled design, made of polyamide, black, degree of protection IP 67	8831-0865
Sensor connecting lead, two-wire, 3 m, blue, with angle connector M12 x 1, 4-pole	8801-2810
Polyethylene filter, connection G 1/4, degree of protection IP 54 Filter check valve made of polyamide or 1.4571, degree of protection IP 65 or NEMA 4. Refer to Application Notes ► AB 08	8504-0066

## 5 Mounting and start-up



### Note:

The mounting accessories (M8 fastening screw, washer and O-ring) are included in the scope of delivery.

### 5.1 Mounting position

The solenoid valve can be mounted in any desired position. The following applies concerning the installation of the valve:

- ➔ Install the solenoid valve in such a way that the filter in the enclosure cover and the cable gland M20 x 1.5 face downward (in cases where this is not possible, mount it in the horizontal position).
- ➔ On mounting, make sure that 300 mm or more clearance is kept above the enclosure cover.

### 5.2 Ambient temperature

The minimum permissible ambient is  
 -20 °C (Types 3701-xxxx xxxx 0),  
 -45 °C (Types 3701-xxxx xxxx 2).

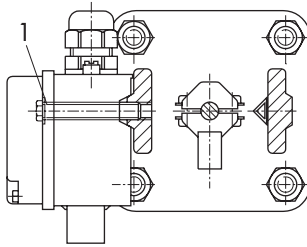
The permissible ambient temperature range is lower for intrinsically safe versions according to EC type examination certificate PTB 01 ATEX 2178 and statement of conformity PTB 02 ATEX 2014 X.

### 5.3 Mounting on linear actuators

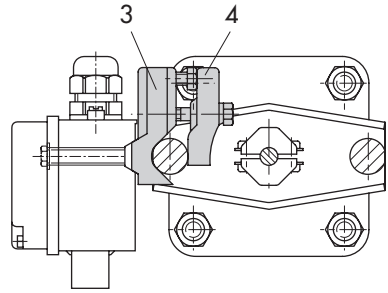
The Type 3701-xxx1 Solenoid Valve is designed for attachment according to IEC 60534-6 (NAMUR).

#### Attachment (see Fig. 3)

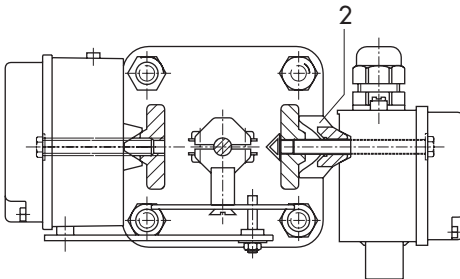
1. Observe instructions on mounting position (see section 5.1).
  2. Remove enclosure cover.
  3. Push washer and O-ring onto the M8 fastening screw (1).
  4. Use the M8 fastening screw (1) to directly fasten the solenoid valve to the yoke of the control valve.
- ➔ For Series 240 Valves (DN 15 to 80) fitted with a positioner or limit switch, additionally mount the distance piece (2) (required accessories: section 4 on page 13).
  - ➔ For valves with rod-type yoke, mount the solenoid valve using a support (3) with clamping plate (4) (required accessories: section 4 on page 13).



Attachment to Series 240 and 250 Valves



Attachment to valve with rod-type yoke



Attachment to valves (DN 15 to 80) with positioner

- 1 Fastening screw with washer and O-ring (supplied mounting accessories)
- 2 Distance piece
- 3 Support
- 4 Clamping plate

Fig. 3: Attachment to linear actuators

## 5.4 Mounting on rotary actuators

### Version for adapter plate

This version of the Type 3701-xxx2 Solenoid Valve is fitted with ports for the output signal (1.3 and 2.3) at the back. In this case, an adapter plate (5) according to VDI/VDE 3845 is required for attachment.

➔ Accessories: section 4 on page 13.

The adapter plate (not mounted) is included in the scope of delivery for Type 3701-xxx0.

### Attachment (see Fig. 4)

1. Observe instructions on mounting position (see section 5.1).
2. Use an M5 x 10 coded grub screw (6) according to DIN 916 to determine the direction of action of the rotary actuator at the connecting flange.
3. Check to make sure the two O-rings are seated correctly.
4. Mount the adapter plate (5) on the NAMUR interface of the actuator using the supplied M5 x 16 screws (7).
5. Push washer and O-ring onto the M8 fastening screw (1).
6. Mount the solenoid valve on the adapter plate using the M8 fastening screw (1).

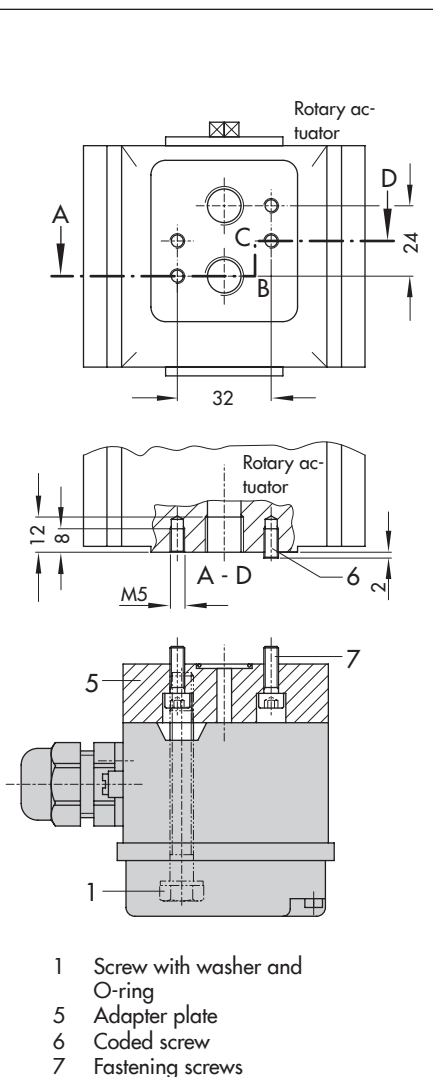


Fig. 4: Mounting on rotary actuators



## 6 Pneumatic connection



### **WARNING!**

*Risk of injury due to high pressure inside device.*

*Prior to performing repair and maintenance work on the solenoid valve, depressurize the connecting lines.*

The air connection are designed as threaded holes with G 1/4 or 1/4 NPT thread depending on the device version.

- ➔ Run and attach the connecting lines and screw joints according to good professional practice.
- ➔ Check the connecting lines and screw joints for leaks and damage at regular intervals and repair them, if necessary.
- ➔ The  $K_{VS}$  coefficient of an upstream pressure reducing valve must be at least 1.6 times larger than the  $K_{VS}$  coefficient of the solenoid valve.

### Port labeling

Inscription	Function
4	Supply air
9	External supply air
1.3/2.3	Output

## 6.1 Sizing of the connecting line

Refer to the table below for the minimum required nominal size of the connecting line at the port 4 of the enclosure.

The specifications apply to a connecting line shorter than 2 m. Use a larger nominal size for lines longer than 2 m.

Port	9	4	1.3/2.3
Pipe <sup>1)</sup>	6 x 1 mm	12 x 1 mm	
Hose <sup>2)</sup>	4 x 1 mm	9 x 3 mm	

<sup>1)</sup> Outside diameter x Wall thickness

<sup>2)</sup> Inside diameter x Wall thickness

## 6.2 Compressed air quality

With internal air supply over port 4 (delivered status):

- ➔ Instrument air (free from corrosive substances), 1.4 to 6 bar

With external air supply over port 9

- ➔ Instrument air (free from corrosive substances), air containing oil or non-corrosive gases, 0 to 6 bar

Compressed air quality according to ISO 8573-1		
Particle size and quantity	Oil content	Pressure dew point
Class 4	Class 3	Class 3
≤5 µm and 1000/m <sup>3</sup>	≤1 mg/m <sup>3</sup>	-20 °C/10 K below the lowest ambient temperature to be expected

## 6.3 Supply air

In the delivered state, the supply air is fed internally over port **4**.

→ On mounting the solenoid valve to rotary or linear actuators fitted with positioners, the supply air must be changed to an external supply air over port **9**.

To change to an external supply through port **9**, proceed as follows:

→ See Fig. 2 on page 9.

1. Open the enclosure cover and unscrew the screw on the turnboard.
2. Turn the turnboard by 90° with the arrow pointing to the number 9. Retighten the screw.
3. Remove the blanking plug in port 9 and replace it with a screw joint.

## 7 Electrical connections

**DANGER!**

*For electrical installation, observe the relevant electrotechnical regulations and the accident prevention regulations that apply in the country of use. In Germany, these are the VDE regulations and the accident prevention regulations of the employers' liability insurance.*

*The degree of protection IEC 60529 is only guaranteed when the enclosure cover is mounted, the exhaust air filters are installed and the connections have been properly mounted.*

*The following regulations apply to installation in hazardous areas:*

*EN 60079-14 (VDE 0165, Part 1)  
Explosive Atmospheres – Electrical Installations Design, Selection and Erection.*

*For intrinsically safe electrical equipment approved in accordance with Directive 94/9/EC, the data specified in the EC type examination certificate apply to the connection of intrinsically safe circuits.*

The electrical connection is made using an M20 x 1.5 cable gland to the terminals in the enclosure or using a connector. Connectors that can be used are listed in the table in section 4.

➔ The terminal assignment is listed in Fig. 5.

## Using a connector

1. Unscrew the M20 x 1.5 cable gland out of the enclosure cover.
2. Screw connector into the thread.

## 7.1 Sizing of the connecting line

We recommend the following size of the connecting lines:

- Conductor cross-section  $\geq 0.5 \text{ mm}^2$
- 6 to 12 mm outside diameter (for M20 x 1.5 cable glands)

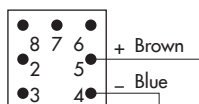
## 7.2 Degree of protection

Devices with a rating of IP 54 can be converted to a rating of IP 65 by exchanging the filter in the enclosure cover.

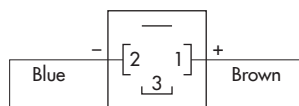
Refer to Application Notes ► AB 08.



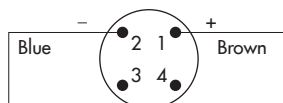
Terminal connection in the enclosure



Harting male angle connector



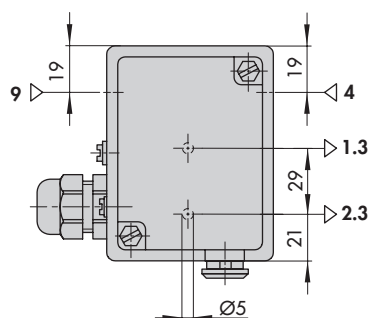
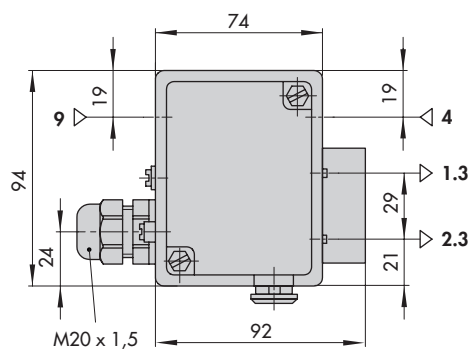
Device cable socket according to DIN 43650



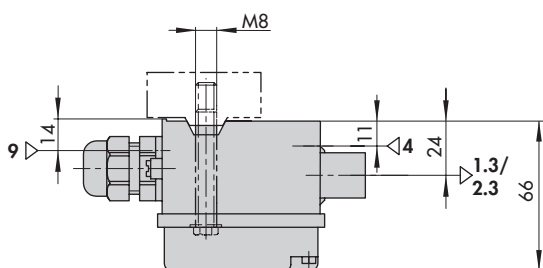
Cable socket M12 x 1

Fig. 5: Wiring plans

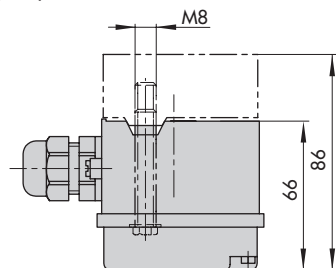
## 8 Dimensions in mm



Adapter plate with NAMUR interface



Dimensions for attachment according to NAMUR



Dimensions for attachment to adapter plate



TRANSLATION

Statement of Conformity



- (1)
- (2) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres – Directive 94/9/EC
- (3) EC Type Examination Certificate Number

PTB 02 ATEX 2014 X

- (4) Equipment: Model 3701-S... Solenoid Valve
- (5) Manufacturer: SAMSON AG Mess- und Regeltechnik
- (6) Address: Weimüllerstr. 3, 60314 Frankfurt am Main, Germany

(7) The equipment and any acceptable variation thereof are specified in the schedule to this certificate and the documents referred to therein.

(8) The Physikalisch-Technische Bundesanstalt, notified body number 0102 according to Article 9 of the Council Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the essential health and safety requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres specified in Annex II to the Directive.

The examination and test results are recorded in confidential report: PTB Ex 02-21476

- (9) The essential health and safety requirements are satisfied by compliance with

EN 50021: 1999

(10) If the sign “X” is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use as specified in the schedule to this certificate.

(11) In compliance with the Directive 94/9/EC this Statement of Conformity relates only to the design and construction of the equipment specified. Further requirements of this Directive apply to manufacturers and marketing of this equipment.

Statements of conformity without signature and seal are invalid.  
This Statement of conformity may be reproduced only in its entirety and without any changes, additions, deletions or omissions that might impair the legal effect of the original.  
Examination of originals and request for the print approval of the Physikalisch-Technische Bundesanstalt.

Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig

PTB-Ex-a.doc

- (12) The marking of the equipment shall include the following:



Zertifizierungsstelle Explosionschutz  
By order

(Signature)

Dr. Ing. U. Johannsmeyer  
Regierungsdirektor

(Seal)

Braunschweig, 07. March 2002

Statements of conformity without signature and seal are invalid.  
This Statement of conformity may be reproduced only in its entirety and without any changes, additions, deletions or omissions that might impair the legal effect of the original.  
Examination of originals and request for the print approval of the Physikalisch-Technische Bundesanstalt.

Physikalisch-Technische Bundesanstalt, Bundesallee 100, D-38116 Braunschweig

PTB-Ex-a.doc



(13) **Schedule**

(14) **Statement of Conformity PTB 02 ATEX 2014 X**

(15) **Description of Equipment**

The Model 3701-8. Solenoid Valve converts electrical binary signals in the input circuit into pneumatic output signals. The main component of the solenoid valve is the Model 1079-27 e-p-Binary Converter Coil which is suitable for nominal voltages of 6V, 12V and 24V.

The device is intended for use inside and outside of hazardous areas.

The correlation between version and temperature classification is shown in the table below:

Version	U <sub>N</sub>	6V	12 V	24 V
Temperature class	T6		60°C	
	T5		-45°C ... 70°C	
	T4		80°C	

(16) **Test report PTB Ex 02-21476**

(17) **Special conditions for safe use**

1. The Model 3701-8. Solenoid valve shall be installed in an enclosure providing at least Degree of Protection IP 54 according to IEC Publication 60529:1989.
2. The wiring shall be connected in such a manner that the connection facilities are not subjected to tensile and/or torsional stress.

(18) **Basic health and safety requirements**

In compliance with the standard specified above.

Zertifizierungsstelle Explosionsschutz Braunschweig, 07 March 2002

By order

(Signature) (seal)

Dr. Ing. U. Johannsmeyer

Regierungsdirektor

Statement of conformity without signature and seal are invalid. This Statement of Conformity may be reproduced only without changes. The results and data in this test report may not be reproduced without the prior approval of the Physikalisch-Technische Bundesanstalt.

Examen et changes shall require the prior approval of the Physikalisch-Technische Bundesanstalt.

Physikalisch-Technische Bundesanstalt, Bundesallee 118, D-38116 Braunschweig

PTB Ex a.d.B.



**ADDENDUM No. 1**

**to the Statement of Conformity PTB 02 ATEX 2014X**

Equipment: Model 3701-8... Solenoid Valve

Marking: II 3G Ex nA II T6

Manufacturer: SAMSON AG Mess- und Regeltechnik

Address: Weismüllerstr. 3, 60314 Frankfurt am Main

**Description of the additions and modifications**

The Model 3701-8 ... Solenoid Valve is permitted to be manufactured in future also in compliance with the certification documents specified in the test report.

For use in Category 3 the solenoid valve satisfies the requirements for EN 50281-1:1999 Class 13 a), b) and c) for low-energy instruments and equipment.

Furthermore, the Model 3701-8 ... Solenoid Valve satisfies the requirements for electrical equipment with protection provided by enclosures in compliance with EN 50281-1:1998.

According to the standards quoted, the Model 3701-8 ... Solenoid Valve shall be provided in addition with the following marking:

II 3 G Ex nA IIC T6  
II 3 D P 65 T 80 °C

The electrical data, the special conditions and all the other particulars shall apply unchanged to the Addendum No. 1.

**Applicable standards**

EN 50021:1989 EN 50281-1:1998

Test report: PTB Ex 06-25370

Zertifizierungsstelle Explosionsschutz  
By order

(Signature) (Seal)

Dr. Ing. U. Johannsmeyer

Director and Professor

Statement of conformity without signature and seal are invalid. This Statement of Conformity may be reproduced only without changes. The results and data in this test report may not be reproduced without the prior approval of the Physikalisch-Technische Bundesanstalt.

Physikalisch-Technische Bundesanstalt - Bundesallee 118 - D 38116 Braunschweig

PTB Ex a.d.B.



## TRANSLATION

### EC TYPE EXAMINATION CERTIFICATE

(1) Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres –  
**Directive 94/9/EC**

(3) EC Type Examination Certificate Number

#### PTB 01 ATEX 2178

- (4) Equipment: Model 3701-1... Solenoid Valve
- (5) Manufacturer: SAMSON AG Mess- und Regeltechnik
- (6) Address: Weismüllerstr. 3, 60314 Frankfurt am Main, Germany
- (7) The equipment and any acceptable variation thereof are specified in the schedule to this certificate and the documents referred to therein.
- (8) The Physikalisch-Technische Bundesanstalt, notified body number 0102 according to Article 9 of the Council Directive 94/9/ of 23 March 1994, certifies that this equipment has been found to comply with the essential health and safety requirements relating to the design and construction of equipment and protective systems intended for use in potentially explosive atmospheres specified in Annex II to the Directive.

The examination and test results are recorded in confidential report.

#### PTB Ex 01-21377

- (9) The essential health and safety requirements are satisfied by compliance with  
**EN 50014: 1997+A1+A2 EN 50020: 1994**
- (10) If the sign "XY" is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use as specified in the schedule to this certificate.
- (11) According to the Directive 94/9/EC this EC Type Examination Certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the Manufacture and supply of this equipment.

PTB13.doc



(12) The marking of the equipment shall include the following:



Zertifizierungsstelle Explosionsschutz  
By order Braunschweig, 29 November 2001

(Signature) (Seal)

Dr. Ing. U. Johannmeyer  
Regierungsdirektor



(13) **S c h e d u l e**

(14) **EC Type Examination Certificate No. PTB 01 ATEX 2178**

(15) **Description of Equipment**

The model 3701-1... Solenoid Valve converts electrical binary signals in the input circuit into pneumatic output signals. It is intended for installation in equipment used inside and outside of a hazardous area.

The main component of the solenoid valve is the Model 1079-27 ... e/p Binary Converter coil, which is a passive two-terminal network that may be connected to certified intrinsically safe circuits, provided the permissible maximum values of  $U_L$ ,  $I_L$  and  $P_L$  are not exceeded.

With suitable dropping resistors the Model 1079-27 ... e/p Binary Converter Coil can accommodate nominal voltages of 6V, 12V and 24V.

**Electrical data**

The correlation between version, temperature classification, permissible ambient temperatures ranges and maximum power dissipation is shown in the table below:

Version	$U_N$	6V	12V	24V
Temperatur class	T6	60°C		
	T5	-45°C ... 70°C		
	T4	80°C		
Characteristic linear or regular		#		##

# The permissible power dissipation  $P_L$  in the version is 250mW.  
## The maximum values for connection to a certified intrinsically safe circuit is shown in the table below:

UI	25V	27V	28V	30V	32V
Ii	150mA	125mA	115mA	100mA	85mA
PI	no limitation				

G negligible, Li negligible

(16) Test report: **PTB Ex 01-21377**

(17) **Special conditions for safe use**

Nons

(18) **Special health and safety requirements**

In compliance with the standard specified above.

Zertifizierungsstelle Explosionschutz  
By order

Braunschweig, 29 November 2001

(Signature) (seal)

Dr.-Ing. U. Johannsmeyer  
Regierungsadjunkt

ADDENDUM No. 1


in compliance with Directive 94/9/EC Annex III Clause 6  
to the EC TYPE EXAMINATION CERTIFICATE PTB 01 ATEX 2178

Equipment: Model 3701-1, ... Solenoid Valve  
Marking:  II 3G FFs in IIC T6  
Manufacturer: SAMSON AG Mess- und Regeltechnik  
Address: Weismüllersr. 3  
60314 Frankfurt am Main

Description of the additions and modifications

The Model 3701-1 ... Solenoid Valve is permitted to be manufactured in future also in compliance with the certification documents specified in the test report.

The Model 3701-1 ... Solenoid Valve satisfies the requirements for electrical equipment with protection provided by enclosures in compliance with EN 50281-1-1998. According to this standard the equipment shall be marked in addition as follows.

 II 2 D IP 65 T 80 °C

The electrical data and all the other particulars shall apply unchanged also to this Addendum No. 1.

Applicable standards

EN 50141:1997 + A1+A2 EN 50201:2002 EN 50281-1:1998

Test report: PTB Ex 06-23369

Zertifizierungsstelle Explosionsschutz  
By order Braunschweig, 22. February 2006

(Signature)

(Seal)

Dr. Ing. U. Johannsmeyer  
Director and Professor

This EC Type Examination Certificate is valid only for the equipment and the conditions of use specified in the certificate. Extensions or changes shall require the prior approval of the Physikalisch-Technische Bundesanstalt.

Physikalisch-Technische Bundesanstalt - Frankfurt a.M. - 60314 Frankfurt am Main

PTB 3701-1

EC-Declaration of Conformity

It is hereby confirmed that the following product

Solenoid Valve  
Type 3701-1...

according to the EC Type Examination PTB 01 ATEX 2178 issued by

Physikalisch Technische Bundesanstalt  
Bundesallee 100  
38116 Braunschweig  
Notified Body No. 0102

complies with the requirements as laid down in the Directives on the Approximation of Legislation of the EC Member States. The requirements of the Directives and Certificates are satisfied by compliance with the following standards:

EMC 2004/108/EC EN 61000-6-2:2005, EN 61000-6-3:2010,  
EN 61326-1:2006  
Explosion Protection 94/9/EC EN 60079-0:2009, EN 60079-11:2012,  
EN 60079-31:2009

Manufacturer:

SAMSON AKTIENGESELLSCHAFT  
Weismüllerstraße 3  
60314 Frankfurt am Main  
Germany

Frankfurt, 2012-09-11



Stephan Nilsch  
Head of Department  
Quality Management



Stefan Ecken  
Head of Department  
Development Electronic Industrial



## EC-Declaration of Conformity

It is hereby confirmed that the following product

**Solenoid Valve**  
**Type 3701**

complies with the requirements as laid down in the Directives on the Approximation of Legislation of the EC Member States. The requirements of the Directives and Certificates are satisfied by compliance with the following standards:

EMC 2004/108/EC EN 61000-6-2:2005, EN 61000-6-3:2010,  
EN 61326-1:2006  
Low Voltage Directive 2006/95/EC EN 60730-1:2011,  
EN 61010-1:2010

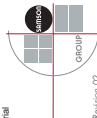
Manufacturer: SAMSON AKTIENGESELLSCHAFT  
Weismüllerstraße 3  
60314 Frankfurt am Main  
Germany

Frankfurt, 2012-09-11

*S. V. Fischer*  
Stephan Michael  
Head of Department  
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*S. E. Eren*  
Stefan Eren  
Head of Department  
Development Electronic Industrial

**SAMSON AKTIENGESELLSCHAFT**  
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Germany • Tel. +49 69 4805-1507  
Internet: <http://www.samson.de>



Revision 02



## EC-Declaration of Conformity

It is hereby confirmed that the following product

**Solenoid Valve**  
**Type 3701-8...**

according to the EC Type Examination PTB 02 ATEX 2014 X issued by

Physikalisch Technische Bundesanstalt  
Bundesallee 100  
38116 Braunschweig  
Notified Body No. 0102

complies with the requirements as laid down in the Directives on the Approximation of Legislation of the EC Member States. The requirements of the Directives and Certificates are satisfied by compliance with the following standards:

EMC 2004/108/EC EN 61000-6-2:2005, EN 61000-6-3:2010,  
EN 61326-1:2006  
Explosion Protection 94/9/EC EN 60079-15:2010, EN 60079-31:2009

Manufacturer: SAMSON AKTIENGESELLSCHAFT  
Weismüllerstraße 3  
60314 Frankfurt am Main  
Germany

Frankfurt, 2012-09-11

*S. V. Fischer*  
Stephan Michael  
Head of Department  
Quality Management

*S. E. Eren*  
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Revision 02



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**EB 3701 EN**

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